Adapted Rumen Microorganisms[1] (ARM) for Feedlot Cattle

J. G. Riley, K. K. Bolsen, and D. L. Good

Summary

Two trials using 200 mixed breed steers were conducted to determine effects of 0, 3, 6, or 12-ounce drenches of Adapted Rumen Microorganisms (ARM) on subsequent feedlot performance. An 85 percent concentrate ration was fed for 90-days before drenching with ARM.

Steers receiving the 12-ounce treatment in trial 1 gained 14.4 pounds more per head during the next 60-day feeding period. The 3 and 6-ounce treatments were less beneficial.

The 12-ounce treatment in trial 2 produced a highly significant ($P < .01$) 15% increase in rate of gain and a 12.5% increase in efficiency compared with the control group.

Introduction

Most veteran cattle feeders have observed that after approximately 90-100 days of full feeding or at 800-900 pounds, Feedlot cattle's rate of gain and efficiency often drop. There are several theories for the "90-day slump" including differences in genetic background, previous treatment, and ration adequacy. Studies at W. R. Grace's Washington Research Center in Clarksville, Md., indicate that the slump may be due, in part at least, to a decreasing ratio of acetate to propionate in the rumen. If so microbial innoculation of rumens of cattle on feed 90 days might stimulate increased gain and efficiency.

Experimental Procedure

Two hundred mixed breed steers were fed a ration composed of 15% sorghum silage and 85% concentrate (rolled milo and supplement) 90 days. In trial 1, 100 steers then were randomly allotted to 20 pens of 5 each and drenched with Adapted Rumen Microorganisms (ARM) (table 1). Fifty of the other 100 steers (trial 2) received a 12-ounce drench of ARM and the other 50 served as controls. Individual weights were taken two consecutive days at both the beginning and the end of each trial and 30 days after drenching. All groups were fed the same ration twice daily. Carcass weight and grade were collected for each steer. None was fed antibiotics or stilbestrol.

[1]Adapted rumen microorganisms, partial financial support, and technical assistance were provided by W. R. Grace and Co., Washington Research Center, Clarksville, Maryland. Represented by O. D. Myrick, Jr. and P. H. Hahn.

Table 1. Experimental Design - Trial 1

No. pens	No. steers	Treatment
8	40	control
4	20	3 ounces ARM
4	20	6 ounces ARM
4	20	12 ounces ARM

Results

Feedlot performance is shown in table 2. Steers drenched with 12 ounces of ARM gained significantly ($P<.01$) more than the undrenched controls. Steers receiving 6-ounce treatment gained 10.1 pounds more each than control steers for the 60-day feeding trial, somewhat less than the 14.4 and 20.0-pound increase of those on the 12-ounce treatment in trials 1 and 2, respectively. Gain and efficiency for the 3-ounce treatment indicated that dosage was not enough to stimulate performance.

The 6-ounce treatment resulted in 4.3% less feed per pound of gain compared with 7.6 and 12.5% for the 12-ounce treatments in trials 1 and 2, respectively. Differences in carcass weights or grades were not significant. Our results agree with those of W. R. Grace and Co.

Table 2. Performance of Steers Drenched with Indicated Quantities of Adapted Rumen Microorganisms (ARM)

Trial	No. Head	Treatment, oz.	Initial wt., lb.	Final wt., *lb.	Total gain, lb.	A.D.G., lb.	Daily D.M. Intake, lb.	Lbs. feed/ lb. gain
1	40	0	905	1038	133	2.22	22.01	9.92
	20	3	902	1028	126	2.10	22.64	10.78
	20	6	903	1046	143	2.39	22.68	9.49
	20	12	903	1050	147	2.46	22.57	9.17
2	50	0	922	1053	131	2.18	22.56	10.35
	49**	12	914	1065	151	2.51	22.75	9.06

* Adjusted to equal dressing percentage
** 1 steer died during trial

Beef Cattle Commercial Feedlot Studies[1,2]

The Livestock and Meat Industry Council initiated a program of purchasing a large group of steers to be used for experimental purposes on topics relevant to the beef cattle feeding industry of Kansas. Objective of the project is to investigate aspects of commercial feedlot operations that are current, or potential, problems: nutrition, health, disease, internal and external parasites, shrinkage, transportation, marketing, management, pollution control, etc. Scientists in various disciplines submit subprojects specifying particular objective(s) and procedure.

The first project used a group purchased in February and sold in June. A second project is in progress.

Results of the first project follow.

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[1] Financial support was provided by the Livestock and Meat Industry Council, Inc. (LMIC)

[2] General Project co-ordinating committee includes
Dr. Ed Smith, Chairman--Animal Science & Industry
Dr. Jack Riley--Animal Science & Industry
Dr. Don Good--Animal Science & Industry
Dr. Steve Armbruster--Animal Science & Industry
Dr. Ralph Lipper--Agricultural Engineering
Dr. Charles Pitts--Entomology
Dr. John McCoy--Agricultural Economics
Dr. Homer Caley--Veterinary Medicine
Dr. Roy Millerett--Veterinary Medicine
Dr. Keith Huston--Agricultural Experiment Station